Dec. 19, 1933. F. VON SCHLEGELL 1,940,033

GOLF PRACTICE AND GAME APPARATUS

Filed Jan. 14, 1931 3 Sheets-Sheet 1

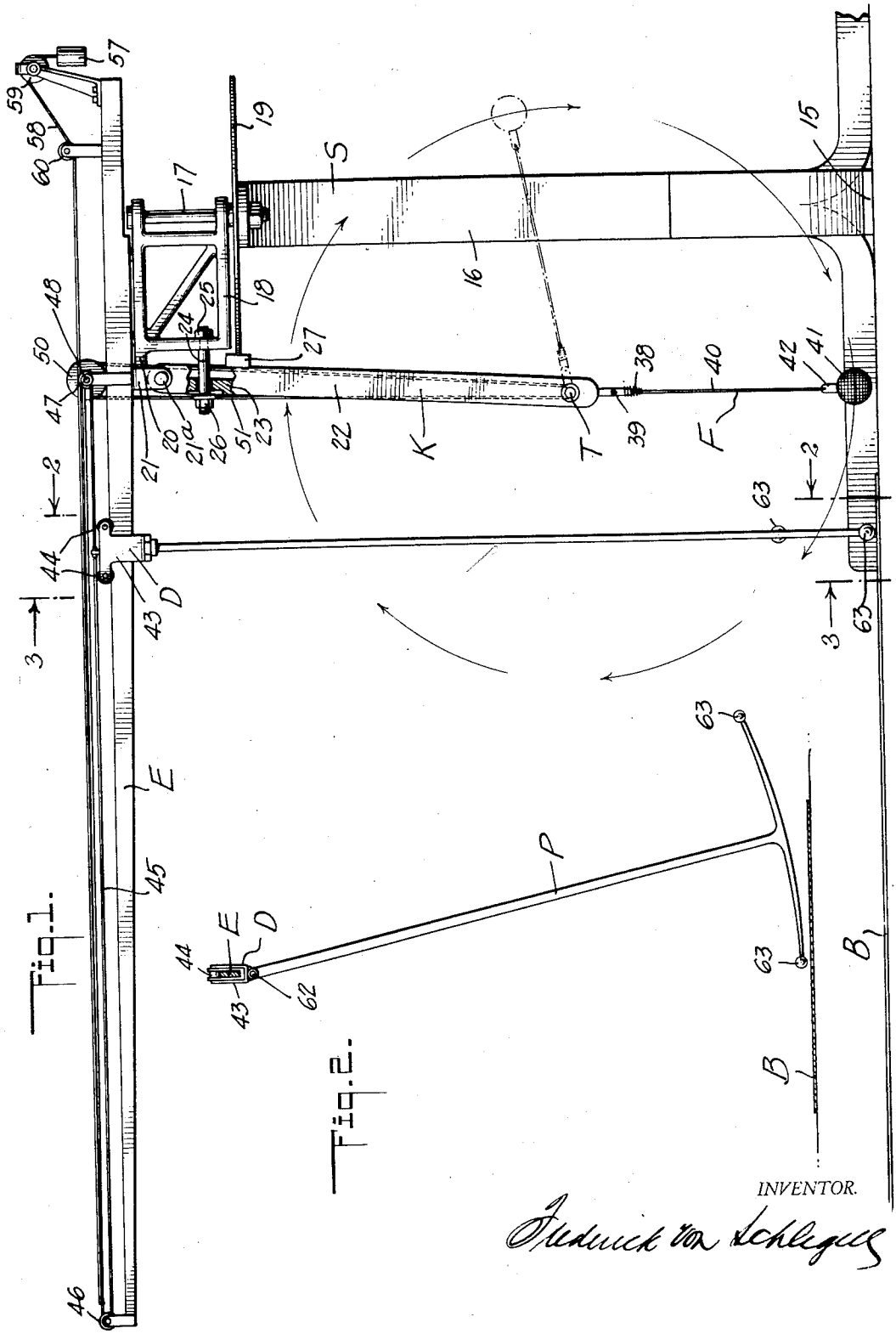


Fig. 1.

Fig. 2.

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Fig. 3.

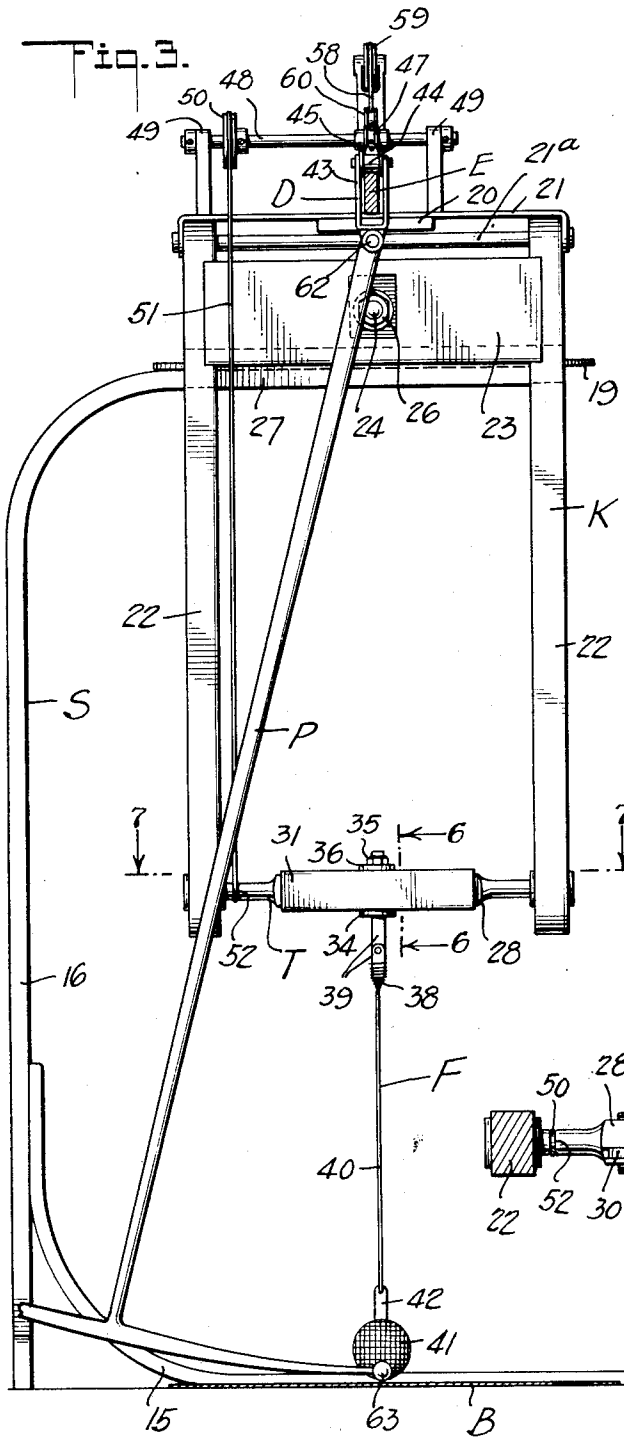


Fig. 4.

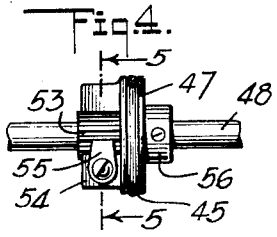


Fig. 5.

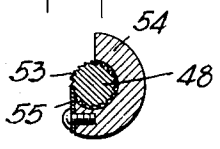


Fig. 6.

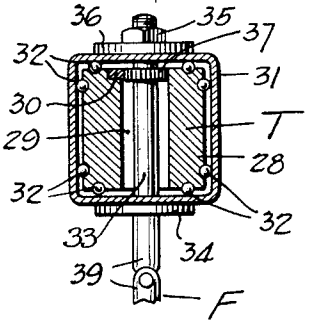
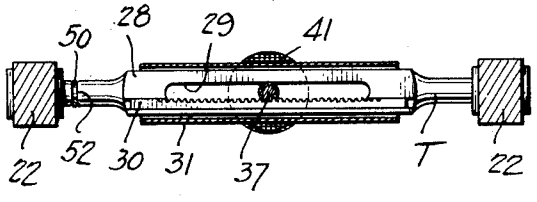


Fig. 7.



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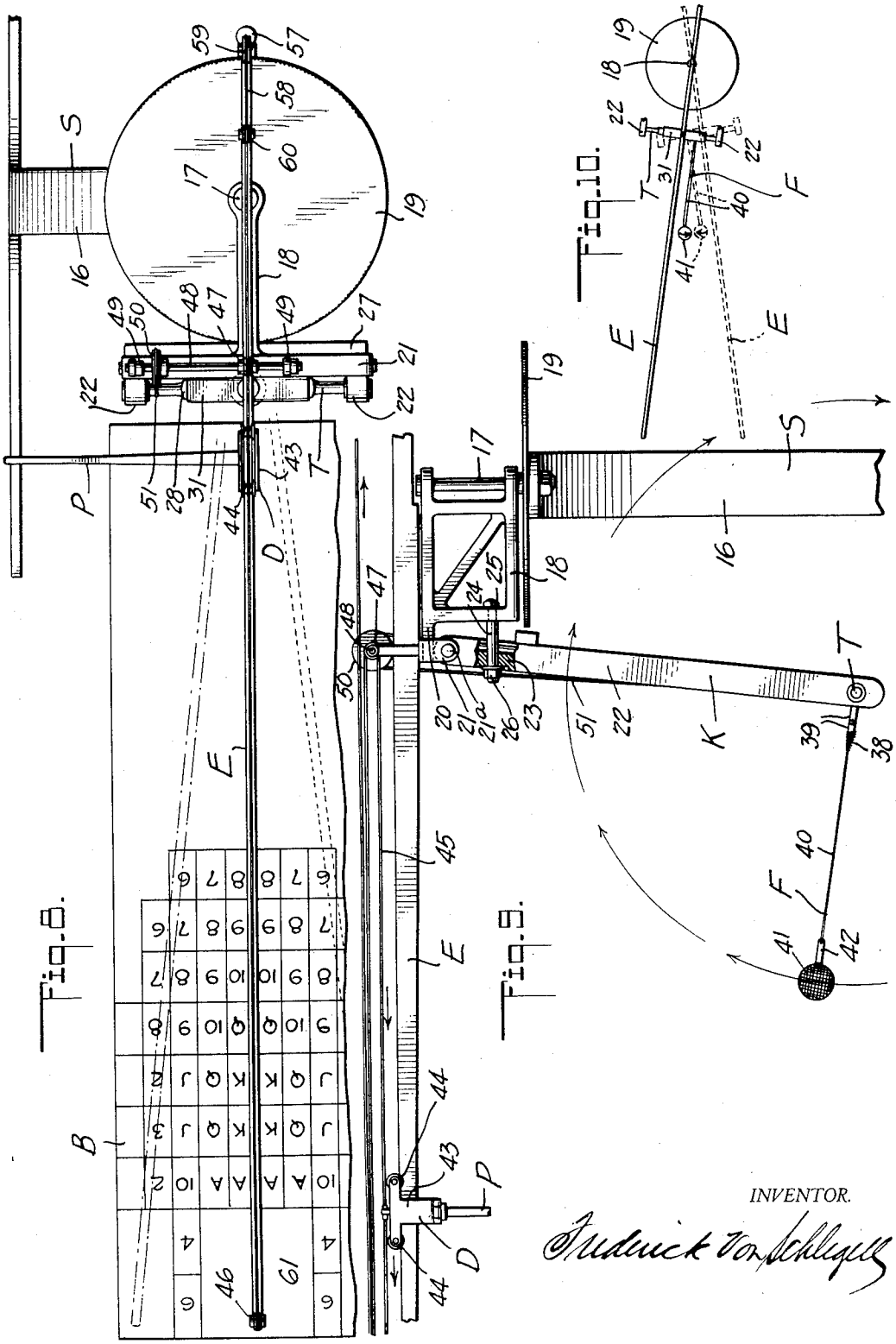


Fig. 8.

Fig. 9.

Fig. 10.

INVENTOR.

Frederick Von Schlegell

Patented Dec. 19, 1933

1,940,033

UNITED STATES PATENT OFFICE

1,940,033

GOLF PRACTICE AND GAME APPARATUS

Frederick von Schlegell, Pasadena, Calif.

Application January 14, 1931. Serial No. 508,635

23 Claims. (Cl. 273—32)

My invention has reference to apparatus by which a golf player is enabled to practice driving and other strokes in golf within a restricted area in order to permit its use either indoors or outdoors, and it also involves the adaptation of such an apparatus as a scoring medium in the playing of a game where the skill of the player both in respect to distance and direction determines the scoring ability of the player.

It is a purpose of my invention to provide a golf practice apparatus which is operable by striking a captive golf ball to visibly demonstrate the distance of a golf shot as well as the direction and straightness thereof.

It is also a purpose of my invention to provide a golf practice apparatus of the character above described and a suitable game board therefor, the apparatus being operable to indicate simultaneously both distance and direction, and with respect to the game board to indicate thereon the result of these two factors in a determination of the ultimate distance of a golf shot to be used in the scoring of points in a game.

I will describe only one form of golf practice and game apparatus embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings:

Figure 1 is a view showing in front elevation one form of golf practice and game apparatus embodying my invention with the parts thereof in normal or starting position.

Figures 2 and 3 are vertical transverse sectional views taken on the lines 2—2 and 3—3, respectively, of Figure 1.

Figure 4 is an enlarged fragmentary plan view showing the clutch for one of the pulleys of the apparatus shown in the preceding views.

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 4.

Figure 6 is an enlarged vertical sectional view taken on the line 6—6 of Figure 3.

Figure 7 is an enlarged sectional view taken on the line 7—7 of Figure 3.

Figure 8 is a view showing the apparatus in top plan.

Figure 9 is a fragmentary view similar to Figure 1 but showing the parts of the apparatus in positions which they assume as a result of the ball being struck and rotated.

Figure 10 is a plan and semi-diagrammatic view of the apparatus for the purpose of illustrating the extreme positions which the indicating arm thereof occupies for indicating direction of flight of the ball.

In carrying out my invention, I provide a suitable support S for supporting the entire apparatus (except the game board) in elevated position with respect to the floor or ground upon which the support rests, the support being structurally characterized by its ability to effectively support the apparatus in a manner to allow the unhampered striking of the captive ball with a golf club, and the unrestricted movement of the ball within its intended range of movement. It is also true that the support allows the complete reversal in position of the apparatus to permit its use by a left hand player as well as a right hand one.

In the present instance, the support includes a base 15 rising from which is a forwardly curved standard 16. Extended through and secured in the upper end of the standard is an axle 17 vertically disposed and upon which is rotatable a radially extending frame 18. Fixedly secured to the axle and standard beneath and clear of the frame is a disk 19.

On top of the frame 18 is secured an indicating element E in the form of an elongated arm or boom, and this element is thus movable about the vertical axis 17 and in either direction from the medial or normal position shown in Figure 8. A major part of the element E extends to the left of the axis 17, as when viewed in Figure 8, that part of the element extending to the right of its axis providing a mounting for sheaves, as will be described hereinafter.

The outer or free end of the frame 18 is formed with an extension 20 to which is secured a U-shaped hanger 21 carrying an axle 21ª constituting the top of a yoke K and on which latter are pivoted the upper ends of a pair of bars 22 constituting the sides of the yoke. A transverse plate 23 rigidly connects the bars adjacent the hanger 21, and through this plate a stud 24 loosely extends with its shouldered end secured in the frame 18 by a nut 25, as best illustrated in Figure 9. The opposite end of the stud has a nut 26 which forms an abutment for the plate 23.

The aforedescribed mounting of the yoke K permits rocking movement thereof about the axle as a center, but by means of the stud the yoke is limited in its rocking movement outwardly from the frame, a result necessary to the proper operation of the apparatus.

The inward swinging movement of the yoke from its normal perpendicular position is completely restrained by a shoe 27 of rubber or other suitable material secured to the yoke and having abutting relation to the periphery of the disk

19. For the purpose of preventing movement of the yoke circumferentially of the axis 17 when the shoe is in engagement with the disk, the periphery of the latter is knurled or otherwise roughened so as to have biting engagement with the shoe.

As best illustrated in Figures 3, 4, and 5, a shaft T is journaled in the lower ends of the bars 22, and this shaft is formed with a non-circular intermediate portion 28, preferably square, and provided with a slot 29, one side face of which is formed with a rack 30. Slidable lengthwise on the shaft portion 28 is a correspondingly shaped sleeve 31, ball bearings 32 being interposed between the two in the manner illustrated in Figure 6.

A pintle 33 extends through the slot 29 and is journaled in the sleeve 31, and this pintle is formed with a bearing 34 to abut the underside of the sleeve, and with a threaded upper end for receiving a nut 35 to confine an upper bearing 36 on the pintle and to secure the pintle against displacement from the sleeve. The bearings 34 and 36 may be of any suitable type to freely support the pintle and its appurtenant parts for rotational movement in the sleeve. A pinion 37 is fixed to the pintle so as to constantly mesh with the rack 30, and as the pintle is mounted in the sleeve and movable laterally in the slot, rotation of the pintle will cause the rack to act through the pinion in sliding the sleeve lengthwise on the shaft T in one direction or the other according as the pintle is rotated in one direction or the other.

To the lower end of the pintle 33 is connected the upper end of a stiff and coiled spring 38 by means of a universal joint 39, the lower end of the spring being connected to the upper end of a rod, strip, or wire 40 made of spring steel to give it the requisite flexibility and yet prevent it from collapsing upon itself under its own weight and that of a ball 41. This ball is preferably a golf ball, and it is fixed to the lower end of the rod 40 so as to be rotatable therewith by means of a stud 42 extended into the ball and secured to the rod.

From the preceding description it will be clear that the pintle 33, joint 39, spring 38, rod 40, and stud 42 constitute in effect a single shaft designated at F upon which the ball is fixed, and that rotation of the shaft F about its own axis will cause it to shift lengthwise on the shaft T in one direction or the other depending upon the direction in which the pintle is rotated. Irrespective of the position of the pintle longitudinally on the shaft T, an operative connection between the two is maintained so that when the ball is rotated about the shaft T as a center such motion will drive the latter.

Driving of the shaft T in this manner is utilized to actuate an indicator D on the arm E and so as to move the indicator outwardly on the arm as will be clear from a consideration of Figures 1 and 9. This indicator D comprises a frame 43 suspended from the arm 16 by grooved collars 44 so as to be freely movable longitudinally on the arm. The frame is connected to the lower stretch of an endless cord 45, the latter being trained about a sheave 46 on the end of the arm E and a second sheave 47 on a shaft 48 journaled in uprights 49 secured to the frame 18.

The shaft 48 is operatively connected to the shaft T by a sheave 50 and an endless cord 51. This cord is also trained about the shaft T, and a groove 52 is formed in the shaft for confining the cord against longitudinal displacement on the shaft.

Thus it will be seen that rotation of the shaft T actuates the cord 51 to rotate the shaft 48, and the latter in turn operates the cord 45 to move the indicator D outward on the arm E, that is, assuming of course that the sheave 47 is fixed to the shaft 48. The sheave 47 is connected to the shaft 48 for rotation by the latter to actuate the cord 45 by the provision of a one way clutch C. This clutch may be of any conventional form and, in the present instance, it comprises a ratchet pinion 53 having a collared hub 56 keyed to the shaft 48, and upon which hub the sheave 47 is loose. By means of a spring pawl 55 secured to a semi-circular collar 54 on the sheave 47, the latter is operatively connected to the pinion when the latter is rotated in a counter-clockwise direction as when viewed in Figure 5.

Thus by means of the clutch C, the indicator D can be restored to its normal or starting position on the arm E without rotating the shafts 48 and T, for when manually pulling on the cord 45, the sheave 47 will rotate freely on the shaft 48.

As an aid in overcoming friction of the parts of the mechanism connecting the indicator D with the shaft D, I provide a weight 57 secured to the end of a cord 58 trained over a sheave 59 and under a sheave 60, both sheaves being mounted on the arm E. From the sheave 60, the cord 58 is extended forward and tied to the upper stretch of the endless cord 45, all as clearly shown in Figure 1. The tendency of the weight 57 is to move the indicator D outward on the arm E, but it cannot rotate the shaft T because of the resistance offered by the ball 41 and the shaft F. However, when the shaft T is rotated by causing the ball 41 and the shaft F to revolve, it allows the weight to move the indicator D.

The operation of my invention as a golf practice apparatus is as follows:

The normal positions of the parts of the apparatus are shown in Figures 1 and 3, and it will be noted that the shaft F together with the ball 41 is in the same vertical plane as the frame 18 and the element or arm E. The indicator D occupies a position adjacent the shaft 43, and which position is the starting point of the indicator in respect to its forward movement from this position.

The player takes his stance in front of the apparatus with his club addressed to the ball 41 so that by swinging his club in the same manner as when performing the regular golf stroke, the ball is struck and thus caused to revolve in a clockwise direction about the shaft T as a center, as indicated by the arrows in Figure 1. Under such revolving movement of the ball, the shaft T is driven and its motion transmitted to the indicator D through the intervening sheave and cord connections. As a consequence, the indicator is caused to travel outwardly on the arm E for a distance the extent of which is determined by the number of revolutions made by the shaft T. In this manner the force with which the ball is driven by the player is measured, and hence, the distance of the stroke performed.

As long as the ball is struck to produce no rotation thereof about its own axis or that axis defined by the shaft F, the shaft F remains in

its medial position on the shaft T but when the ball is struck so as to be spun in either direction about its own axis, the shaft F shifts bodily to the right or left along the shaft T depending upon the direction of rotation of the ball. Resultant of this action, the vertical plane of rotation of the ball is shifted laterally in respect to the vertical plane defined by the axis 17 and the transverse axis of the shaft T, and thus the force exerted by the rotating ball no longer acts in this original plane.

Irrespective of the vertical plane of rotation of the ball, the force exerted by the ball in its rotative movement tends to oscillate the yoke K about the axis 21a as a center, but through the medium of the shoe 27 and the disk 19 movement of the yoke to the right from the position shown in Figure 1, is checked, while movement of the yoke in the other direction from this position is limited by the stud 24 but not completely checked. Its degree of movement in this direction is such as to move the shoe 27 free of the disk 19 so that if the force exerted by the rotating ball is off center with respect to the arm E, the arm E can respond to such force and be thus moved laterally about the axis 17 as a center.

The ball is only active to impart a turning movement to the arm E during one half of each revolution about the axis T, for it will be understood from a consideration of Figure 1 that the ball in its swinging movement to the right side of the yoke K exerts a force which tends to swing the yoke toward the disk, while the ball, in the other half of its movement, exerts a force which tends to swing the yoke in the opposite direction. Were the yoke free to respond to these equal and opposite forces exerted by the rotating ball, although the plane of rotation of the ball may be off center with respect to the arm E or the shaft T, they would merely impart an oscillating movement to the arm. However, by checking movement of the yoke toward the disk, only that force generated by the ball in its swinging movement to the left side of the yoke is permitted to act upon the yoke and arm, and, as a consequence, the arm E is caused to turn in a step by step movement about its axis 17.

Let it be assumed that the ball is revolving in the plane illustrated in solid lines in Figure 10. The resultant force exerted by the ball acts to move the arm E in a clockwise direction about the axis 17, and it will be understood that the extent of this force and the consequent turning movement of the arm is dependent upon the degree to which the vertical plane of rotation of the ball is shifted from the plane of the arm. Conversely, with the ball and its mounting shifted to the opposite side of the arm E, as illustrated in dash lines in Figure 10, the force exerted by the ball about the axis 17 will move the arm E in a counter-clockwise direction, as indicated in dash lines, and likewise the extent of this movement is dependent upon the degree to which the ball has shifted its plane of rotation from that plane coinciding with the arm E.

It will be surmised that the afore-described movements of the arm E, in consequence of the lateral shifting of the vertical plane of rotation of the ball 41, are utilized to visibly indicate the extent to which the ball has been sliced or hooked, for it will be understood that as the ball is rotated in one direction or the other about its own axis, the consequent shifting of the plane of rotation of the ball will cause the arm to swing in one direction or the other from its normal position, thus indicating a hook or slice as determined by its direction of movement from its central position, and the extent of the hook or slice by the degree of movement.

As long as the ball is struck so that it revolves in a plane coincident with the axis 17 and the center or transverse axis of the shaft T, and with no turning or spinning movement of the ball about its own axis, no lateral or turning movement of the arm E from its normal or straight-forward position occurs, and hence, it is indicative of the fact that the golf shot is a perfect one in point of direction.

As will be understood by golf players, one, in actual play, often unintentionally executes a golf shot in which the ball is neither hooked nor sliced, but is inaccurate in point of direction with respect to the green or to the objective. Such a shot is known in golf as a pulled shot or pushed shot, depending upon whether the ball travels to the left or right of the line of play. Retaining in mind that a straight shot executed on my apparatus is indicated by the arm E failed to move from its straight-forward position, let it be assumed that a practicing player strikes the ball so that its plane of bodily rotation is no longer coincident with the transverse axis of the shaft T and the axis 17, but is at an angle thereto and with no spin of the ball about its own axis. Under such a condition the force exerted by the ball revolving in this angular plane operates to move the arm E to the right or left from its normal position depending upon whether the angle of the plane of rotation of the ball is to the right or left. This result is effected by reason of the fact that the force of the revolving ball acts at a point spaced from the axis 17. Thus the arm E visibly demonstrates the direction of the shot and its straightness with respect to the intended or proper line of play.

Now let us assume a condition in which the ball is struck to produce a shot which is not only pulled or pushed, but, in addition, is hooked or sliced. In the event of a pulled and sliced shot, the ball will, as a result of pulling the shot, revolve in a plane angular with respect to the arm E and the axis 17, and under the spinning movement of the ball about its own axis as a result of slicing the ball, this angular plane of rotation will shift to the left, as when viewed in Figure 8. The resultant action on the arm E is to first move the latter to the left from its normal position, and then, under the slicing action of the shot, to cause the arm to gradually move to the right. Conversely, in the instance of a pushed and hooked shot, the arm E moves first to the right and then gradually to the left, to simulate the ball movements of a corresponding shot in golf. Thus the arm movements are a visible demonstration of the hook and pull or the slice and push characteristics of a shot whichever the case may be.

From this mode of operation, it will be manifest that, in the instance of a player who invariably slices or hooks in actual golf play, he can on my apparatus, as he does in actual play, play his shot in such a direction with respect to the objective as to compensate for such a fault, with the object in view of the arm occupying its normal straight-forward position when it finally comes to rest and to thereby visibly demonstrate to the player that the ball has reached its objective, or is in the proper line of play

with respect to the objective when it finally reaches the end of its travel.

In providing a flexible rod 40 and a spring 38, the possibility is precluded of the rod being bent should it be accidentally struck with a golf club, while the spring serves as a yieldable connection between the rod and universal joint to prevent damage of the latter and breaking of the rod should the ball be struck about its horizontal center. Also, the yieldable connection permits the ball to yield when struck above center to lessen the force of impact so that the resultant number of revolutions of the shaft T will be less than when the ball is struck along its horizontal center, and hence the distance traveled by the indicator D is correspondingly shortened to penalize the player for such an imperfect or topped shot. Further, the universal joint 39 permits a "break" in the shaft F when the ball is hit below its horizontal center which, likewise, reduces the number of ball revolutions and in consequence, the distance traveled by the indicator to penalize a player when making an "undercut" shot.

In the adaptation of my apparatus for the playing of a game, I employ a game board B which is laid on the floor or ground beneath the arm 16 so that the indicator D and the arm can be utilized to designate on the board, points of different value in scoring. However, in order to obtain a true result in scoring when considering the two factors of distance and direction involved in every shot in golf, I combine the movements of the indicator D and the indicating element E into a single and resultant action. This is attained by the provision of a pointer P which is suspended from the frame 43 so as to overlie the board B and to be movable lengthwise of the board by the frame 43 and transversely of the board by the arm E.

The surface of the board B can be divided into spaces in any manner suited to the longitudinal and transverse movements of the pointer, and likewise suitable scoring symbols can be employed and arranged in the surface divisions in point of scoring value so that the position of the pointer resultant of golf shots of various degrees of distance and direction will designate symbols of corresponding scoring value in keeping with the perfection of the golf shot.

The afore-described arrangement of the symbols is illustrated in Figure 8 and, as will be noted, I have employed letters and numerals corresponding to the symbols of a deck of cards. These symbols are arranged about a relatively large surface division 61 which designates a "green", and it will be noted that the free extremity of the arm 16 is normally positioned to overlie this division so that when a golf shot of maximum distance and direction is executed, the pointer in its movement along the arm will come to rest within this division. As the arm is moved to the right or left from its normal position, as indicated by the dot and dash lines in Figure 1, the pointer will be caused to travel in a corresponding path and come to rest in the smaller divisions to point to symbols of lesser value as a penalty for hooking or slicing.

By reason of the fact that the arm E is mounted to swing about the axis 17, and that all moving parts of the apparatus are carried by the arm, it will be clear that the arm can be moved to a position diametrically opposed to that illustrated in Figure 8 to render the apparatus operable by a left hand golf player as distinguished from a right hand golf player using the apparatus in the position illustrated. To adapt the pointer P to use for both left and right hand players, it is made of T-form as best illustrated in Figure 2, and its upstanding portion is connected to the frame 43 by a friction hinge 62 so as to allow the pointer to be swung from its position shown in Figure 2 and held in an opposite position in respect to the arm E. The lateral portions of the pointer are curved and terminate in knobs 63 so that in either extreme position of the pointer either one knob or the other is disposed along the longitudinal axis of the board. This construction of the pointer permits it to be suspended from the arm E and positioned as described without being disposed in the path of ball 41 or the club of the player so that the player has the requisite freedom of action in swinging the club incident to the performance of a golf shot.

Although I have herein shown and described only one form of golf practice and game apparatus embodying my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim:

1. A golf practice apparatus comprising a ball mounted for rotation about an axis therethrough and for bodily rotation about another axis, and means responsive to rotation of the ball about the first mentioned axis for shifting the ball bodily along the other axis from a medial position thereon and in either direction therefrom depending upon the direction of rotation of the ball about said first mentioned axis.

2. A golf practice apparatus comprising a ball mounted for rotation about an axis therethrough and for bodily rotation about another axis, and means responsive to rotation of the ball about the first mentioned axis for shifting the ball bodily along the other axis from a medial position thereon and in either direction therefrom depending upon the direction of rotation of the ball about said first mentioned axis, and for a distance depending upon the degree of rotation of the ball about said first mentioned axis.

3. A golf practice apparatus comprising a ball mounted for rotation about an axis therethrough and for bodily rotation about another axis, means responsive to rotation of the ball about the first mentioned axis for shifting the ball bodily along the other axis from a medial position thereon and in either direction therefrom depending upon the direction of rotation of the ball about said first mentioned axis, and for a distance depending upon the degree of rotation of the ball about said first mentioned axis, and an indicating member movable and so connected to the first means as to register the opposite direction and degree of bodily shifting of the ball.

4. A golf practice apparatus comprising a ball mounted for rotation about an axis therethrough and for bodily rotation about another axis, and means responsive to rotation of the ball about said first mentioned axis for shifting the ball bodily along the other axis in either direction according as the ball is rotated about said first mentioned axis in one direction or the other.

5. A golf practice apparatus comprising a ball mounted for rotation about an axis therethrough and for bodily rotation about an axis at right angles to said first mentioned axis, means for indicating the movement of the ball about said

first mentioned axis and the direction of such movement, and means for indicating the movement of the ball bodily about the second mentioned axis, the last means being movable longitudinally of the first means.

6. A golf practice apparatus comprising a ball, a horizontally positioned member, means for mounting the ball for rotation bodily about the member as a center and for rotation about an axis therethrough, and an operative connection between said means and the member for causing the ball to move lengthwise of the member and in one direction or the other according as the ball rotates about said axis in one direction or the other.

7. A golf practice apparatus comprising a ball, a horizontally positioned member, means for mounting the ball for rotation bodily about the member as a center and for rotation about an axis therethrough, an operative connection between said means and the member for causing the ball to move lengthwise on the member and in one direction or the other according as the ball rotates about said axis in one direction or the other, whereby the vertical plane of rotation of the ball is varied accordingly, an indicating element movable about a vertical axis disposed in a plane intersecting the horizontal plane of the member, and means operatively connecting the member and element for causing the element to move to the right or left from a central position according as the plane of rotation of the ball is to the left or right of the vertical plane of the element.

8. A golf practice apparatus comprising an indicating element mounted for movement about a vertical axis, a ball mounted on the element for rotation about an axis therethrough and bodily about a horizontal axis to which the first axis is radial, means for causing the ball to shift its plane of rotation bodily on the horizontal axis in one direction or the other lengthwise of said axis according as the ball rotates in one direction or the other about the ball axis, and means for utilizing the force exerted by the ball to move the indicating element in a direction corresponding to the direction of flight of a golf ball having the same rotative movement about the same axis therethrough.

9. A golf practice apparatus comprising an indicating element mounted for movement about a vertical axis, a ball, means for mounting the ball for rotation about an axis therethrough, means for mounting the first means for rotation bodily about a horizontal axis to which the ball axis is radial, means for causing the ball to shift its lane of rotation bodily on the horizontal axis in one direction or the other lengthwise of said axis according as the ball rotates in one direction or the other about the same axis therethrough, means for utilizing the force exerted by the ball to move the indicating element in a direction corresponding to the direction of flight of a golf ball having the same rotative movement about its own axis, and means mounted on the indicating element and operatively connected to the second mentioned means for registering rotative movements of the ball bodily about the horizontal axis.

10. A golf game apparatus comprising a game board, a pointer movable in two directions over the game board, a ball, means operatively connecting the ball to the pointer so as to move the latter in one direction over the board when the ball is rotated about an axis therethrough and simultaneously rotated bodily about another axis, and means so correlated to the first means as to move the pointer in the other direction only when the ball is rotated bodily about said other axis.

11. A golf game apparatus comprising an elongated game board, a pointer movable longitudinally and transversely in either direction over the game board, a ball, means operatively connecting the ball to the pointer for moving the pointer longitudinally of the board when the ball is rotated bodily about an axis therethrough, and means so correlated to the first means as to move the pointer transversely of the board in one direction or the other when and according as the ball is rotated in one direction or the other about said axis and simultaneously rotated bodily about said axis.

12. A golf practice apparatus comprising an arm mounted to swing about a vertical axis, a ball mounted to rotate bodily about a horizontal axis and to rotate about an axis therethrough, and means operatively connected to the ball and arm for swinging the arm in one direction or the other in response to and according as the ball is rotated in one direction or the other about the said axis therethrough and simultaneously rotated bodily about the horizontal axis.

13. A golf practice apparatus comprising an arm mounted to swing about a vertical axis, a ball mounted to rotate bodily about a horizontal axis and to rotate about an axis therethrough, means operatively connected to the ball and arm for swinging the arm in one direction or the other in response to and according as the ball is rotated in one direction or the other about the said axis therethrough and simultaneously rotated bodily about the horizontal axis, registering means movable on the arm, and means connecting the registering means with a part of the first means for moving the registering means in accordance with the revolutions of the ball bodily about the horizontal axis.

14. A golf practice apparatus comprising an indicating arm mounted to swing about a vertical axis in either direction from a medial position, a yoke horizontally pivoted on the arm at one side of the vertical axis of the latter, a ball mounted on the yoke for rotation about an axis therethrough and bodily about a horizontal axis to which the ball axis is radial, means for causing the ball to shift its plane of rotation bodily on the horizontal axis in one direction or the other lengthwise of said axis from a medial position coinciding with the medial position of the indicating arm and according as the ball rotates in one direction or the other about the said axis therethrough, and means for restraining swinging movement of the yoke in one direction under rotation of the ball bodily so that the force of the ball exerted by its rotation is utilized to move the indicating arm from its medial position in one direction or the other depending upon to which side of the vertical axis of the arm the ball has been moved.

15. A golf practice apparatus comprising a ball, a horizontally disposed shaft, means for mounting the ball for rotation bodily on the shaft and for rotation about an axis therethrough, an operative connection between said means and the shaft for causing the ball to move lengthwise on the shaft and in one direction or the other according as the ball rotates about said axis therethrough in one direction or the other whereby, the vertical plane of rotation of the ball is varied accordingly, an indi-

cating arm movable about a vertical axis situated at one side of the shaft, means operatively connecting the shaft and arm for causing the arm to move to the right or left from a central position according as the plane of rotation of the ball is to the left or right of the vertical plane of the arm, and an indicator movable along the arm and operatively connected to the shaft for indicating the revolutions of the shaft by the distance traveled on the arm.

16. A golf practice apparatus comprising a support, an arm movable on the support about a vertical axis, a yoke depending from the arm at a point spaced from its axis and horizontally pivoted thereon to swing radially of the arm axis, a member fixed to the support, a second member fixed to the yoke and coacting with the other member to restrain the yoke against swinging movement toward the axis of the arm in any circumferential position of the yoke in respect to the arm axis, a ball, means for mounting the ball on the yoke for rotation bodily about a horizontal axis tangent to a circle having the arm axis as a center to impart swinging movement to the yoke, and for rotation about an axis therethrough, means for causing the ball to shift its plane of rotation bodily on the horizontal axis in one direction or the other lengthwise of said axis according as the ball rotates in one direction or the other about the axis therethrough whereby, when the plane of rotation of the ball is shifted in one direction or the other from that coinciding with the plane of the arm, the force exerted by the ball in its bodily rotation will act through the yoke to move the arm in one direction or the other from a central position.

17. In a golf practice apparatus, a yoke supported for swinging movement about a horizontal axis, a member positioned horizontally in the yoke, a horizontally disposed rack on the member, a shaft rotatable in and extending radially from the member, a pinion on the shaft meshing with the rack, and a ball fixed on the shaft.

18. In a golf practice apparatus, a yoke, a shaft journaled in the yoke and having a non-circular part provided with a slot, a rack on one wall of the slot, a non-circular sleeve movable lengthwise on the non-circular shaft part, a second shaft journaled in the sleeve and having a pinion meshing with said rack, and a ball fixed to the second shaft.

19. A golf practice apparatus comprising a ball, a horizontally disposed shaft, means for mounting the ball for rotation bodily on the shaft and for rotation about an axis therethrough, an operative connection between said means and the shaft for causing the ball to move lengthwise on the shaft and in one direction or the other according as the ball rotates about said axis therethrough in one direction or the other whereby, the vertical plane of rotation of the ball is varied accordingly, an indicating arm movable about a vertical axis situated at one side of the shaft, means operatively connecting the shaft and arm for causing the arm to move to the right or left from a central position according as the plane of rotation of the ball is to the left or right of the vertical plane of the arm, an indicator movable along the arm, and a pulley and cord connection between the indicator and said shaft to move the indicator on the arm in accordance with the revolutions of the shaft.

20. A golf game apparatus comprising a support, an arm mounted on the support to swing about a vertical axis, a game board beneath the arm, a pointer movable along the arm and over the game board, a ball mounted on the arm to rotate bodily about one axis and for rotation about an axis therethrough, means correlated to the ball and arm for moving the arm in one direction or the other when the ball is rotated in one direction or the other about said axis therethrough and bodily about the other axis, and means correlated to the ball and pointer for moving the pointer along the arm in accordance with and in response to rotation of the ball bodily about said axis.

21. A golf game apparatus as embodied in claim 20 wherein the arm, and game board are reversible in position with respect to the support and the pointer reversible in position on the arm for allowing either a right or left hand player to strike the ball and thus operate both of said means.

22. A golf game apparatus as embodied in claim 20 wherein the game board has symbols thereon of different scoring value, said symbols being arranged on the board according to the scoring value thereof in respect to the normal position of the arm and the starting position of the pointer in such manner that symbols of increasing scoring value are designated by the pointer as the latter travels outwardly on the arm from its starting position while symbols of decreasing value are designated as the pointer is moved by the arm in either direction from a normal position.

23. A golf practice apparatus comprising an arm supported for movement about a vertical axis and in either direction from a normal position, a ball, means for mounting the ball on the arm for revolving movement about a horizontal axis which is spaced laterally from the arm axis, and means for supporting the ball on said mounting means for rotation about an axis therethrough and so that the supporting means can move lengthwise in either direction along the mounting means to change its vertical plane of revolving movement according as the ball is rotated about said axis therethrough in one direction or the other.

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